

Introduction

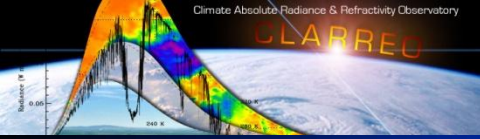
David Young – CLARREO Project Scientist

CLARREO

The background of the slide features a composite image. At the top, a satellite with solar panels is visible against a starry space background. Below this, the Earth's horizon is shown with a bright sun or star. In the foreground, a large, curved, multi-colored band (orange, yellow, green, blue, purple) represents a climate model or data visualization. This band is overlaid with a black line graph showing fluctuations. The bottom of the image shows a mountainous landscape. The word 'CLARREO' is written in large, stylized letters across the middle of the image.

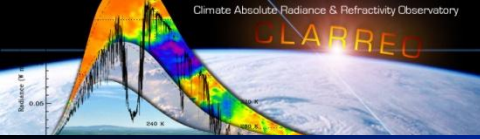
1st CLARREO SDT
Team Meeting

May 17-19, 2011
NIA, Hampton, VA



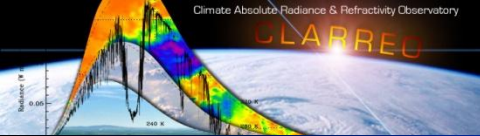
Meeting Goals (recap)

- **Introduction of Team** ✓
 - Reach agreement on team roles and guidelines for interactions ✓
- **Presentation of recent results and planned research** ✓
 - Identify opportunities for future collaboration ✓
- **Collectively develop the path forward**
 - SDT coordination
 - Identification of critical science studies
 - Strategic planning
 - Future opportunities
 - Planning for next Decadal Survey
 - Communicating CLARREG externally



SDT Coordination

- Working Group Structure is eliminated
- Coordination can be done directly among Team members
 - Please let Bruce or I know (to avoid duplication)
- Telecon frequency
 - 1 / month or as needed?
- Meeting frequency
 - Currently planned as 2 / year.
 - Next meeting should be at an external member site
- How do we incorporate engineering in our planning?
- Any other issues?

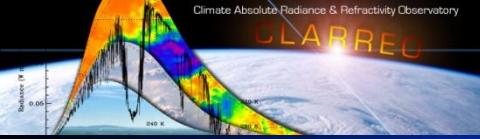


Identification of Additional Studies

CLARREO Refocus Activities and Deliverables

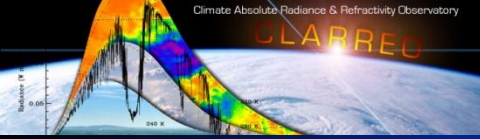
Deliverables are shown in bold text

| Science Study Focus Area | Organizations | 2011 | 2012 | 2013 | 2014 | 2015 |
|--|-------------------------------|---------------------------|------------------------------|----------------------------------|----------------------------------|---------------------|
| <i>IR SI Traceability</i> | LaRC/NIST/UW/Harvard/UK/Italy | SI Design | CDS Analysis | Dev Inst Model | Test Inst Model | Final Report |
| <i>RS SI Traceability</i> | GSFC/NIST/LASP/UK-NPL | SI Design | CDS Analysis | Dev Inst Model | Test Inst Model | Final Report |
| <i>IR Spectral Inst. Reductions: Capability/Cost</i> | LaRC/GSFC/UW/Harvard | Limit Spectral | Vary Accuracy | Alt Methods | Alt Methods | Final Report |
| <i>RS Spectral Inst. Reductions: Capability/Cost</i> | GSFC/LASP | Limit Spectral | Vary Accuracy | Alt Methods | Alt Methods | Final Report |
| <i>Decadal Change Climate OSSEs</i> | UC Berkeley/U Michigan/Canada | IR/RS/RO | Alt Orbits | Clim. Sensitivity | AR5/CFMIP | Final Report |
| <i>Climate Change Spectral Fingerprinting</i> | LaRC/Berkeley/LASP/Miami | Fast RS code | IR/RS/RO | Nonlinearities | Cloud Amt/Prop | Final Report |
| <i>Climate Change Reference Intercalibration</i> | LaRC/GSFC/UW/NOAA/GSICS | Alt Orbits | Polariz Models | Alt Methods | Alt Methods | Final Report |
| <i>Suborbital Options for IR Reference Intercal</i> | UW/LaRC/NIST | Aircraft | Aircraft | Airships | Airships | Final Report |
| <i>Suborbital Options for RS Reference Intercal</i> | LASP/LaRC/NIST | Aircraft | Aircraft | Airships | Airships | Final Report |
| <i>Decadal Stability of Retrieval Algorithms</i> | LaRC/UMd | IR tests | IR/RS tests | IR/RS Methods | IR/RS Methods | Final Report |
| <i>Orbital Sampling for Spectral Fingerprinting</i> | LaRC | Alt Orbits | Natural Var | Alt Methods | Alt Methods | Final Report |
| <i>Orbital Sampling for Reference Intercalibration</i> | LaRC | Alt Orbits | Natural Var | Alt Methods | Alt Methods | Final Report |
| <i>GNSS-RO Improvements for climate change</i> | Harvard/JPL/LaRC | < 5 km | < 5 km | > 20km | > 20 km | Final Report |
| <i>Data Systems to Support Studies</i> | Pleiades Supercomputer/ASDC | OSSEs/Analysis | OSSEs/Analysis | OSSEs/Analysis | OSSEs/Analysis | |
| Documentation: Journal Papers, Reports | | All | All | All | All | All |
| CDS Focus Area | | | | | | |
| <i>IR Calibration Demonstration System (CDS)</i> | LaRC/GSFC/NIST | Assemble | Complete/Cal | Cal/Cap Trades | Cal/Cap Trades | Final Report |
| <i>RS Calibration Demonstration System (CDS)</i> | GSFC/NIST | Assemble | Complete/Cal | Cal/Cap Trades | Cal/Cap Trades | Final Report |
| Engineering Focus Area | | | | | | |
| <i>Reduced IR Instrument Studies</i> | LaRC/GSFC | Preliminary Design / Cost | Accommodation Assessment | Science Value Assessment | Science Analysis / Design Update | Final Report |
| <i>Reduced RS Instrument Studies</i> | GSFC/LaRC | Preliminary Design / Cost | Accommodation Assessment | Science Value Assessment | Science Analysis / Design Update | Final Report |
| <i>Accommodation and Access to Space Analyses</i> | LaRC | Identify Options | Cost Analysis / Verification | Science Analysis / Design Update | Finalize options and costs | Final Report |



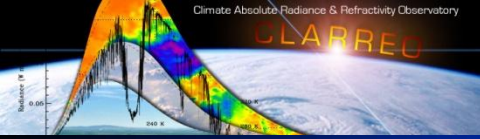
Future opportunities

- R&A solicitations
 - Guidance: Team members should look for opportunities to propose related work, but do **NOT** re-propose the same work.
- Venture Class solicitations
 - Guidance:
 - VC missions and instruments are not intended to replace or advance individual Decadal Survey missions, however they can address portions of mission science
 - Don't call it "CLARREO"
 - Missions must have compelling science that can be achieved in the nominal mission life
- Partnerships
 - Guidance: We can pursue alternative means of achieving CLARREO science objectives, including potential partnerships
- Others?



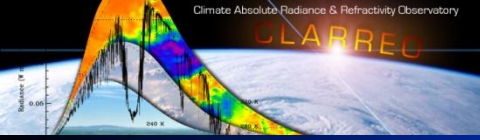
Potential Partnerships

- UK (TRUTHS)
 - UKSA
 - Imperial
 - UK Met Office
 - NCEO
- Italy (FORUM)
- ESA
- EUMETSAT
- Korea Met Center
- NIST
 - Other NMI?
- NOAA
- What else?



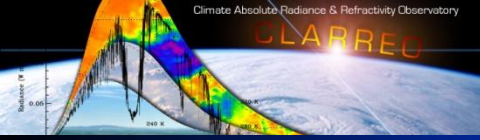
Strategic Communications

- Guidance:
 - We can still talk about CLARREO as a mission, but not as a particular mission architecture with a launch date
 - Focus on the measurements and science and “possible” solutions
- How do we reach the right constituencies and audiences?
 - Journal articles
 - Conferences
 - Engage key groups (CEOS, GCOS, GSICS, etc
 - What else?
- Consistent message
 - “CLARREO is not dead”
 - CLARREO SDT continues and is supported
 - Work continues as described in White Paper
 - What else?

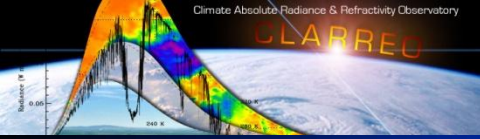


Planning for the Next DS

- We need to complete and publish our science studies
- Work collectively on answering key questions in preparation of the next DS

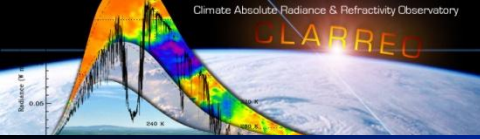


Backups



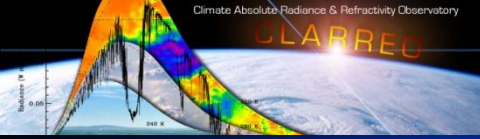
ROSES Opportunities

- Solicitation is still in draft form
 - Amendments could be made anytime throughout the year
- 25 opportunities, ~\$48 Million, funding about 250 proposals
- Funding is for FY12 start
- CLARREO Relevant Opportunities
 - Satellite Calibration Interconsistency Studies: \$2M (Lucia Tsaoussi)
 - GNSS Remote Sensing Science Team: \$1.5M (John LaBrecque)
 - Advanced Information Systems Technology (AIST): \$8.3M (Karen Moe)



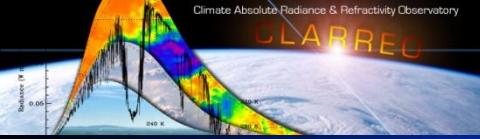
Earth Venture – 2 (EV-2) Investigations

- The second call for Venture-class investigations, or Earth Venture-2 (EV-2), will solicit proposals for a complete, principal investigator-led mission to conduct innovative, integrated, hypothesis or scientific question-driven approach to pressing Earth system science issues
 - **Sustained, science-based data acquisition** — The successful investigation must advance Earth system science objectives through a focused orbital measurement of sufficient clarity and breadth to prove/disprove a scientific hypothesis or address scientific questions.
 - **Mature technology** — All proposed investigations must use mature system technology where, at a minimum, there has been a system/sub-system model or prototype demonstration in a relevant environment (Technology Readiness Level (TRL) of 6 or greater by PDR).
 - **Competitive selection** — The investigations will be selected in an open competition, to ensure broad community involvement and encourage innovative approaches. Single step selection.
 - **Cost and schedule constraints** — The successful proposal must be accomplished a life cycle from initiation to launch in less than 5 years and a total life cycle cost not to exceed \$150M, including reserves.
- EV-2 Draft Announcement of Opportunity released 2/15/2011 and with the winning selection in early FY2012



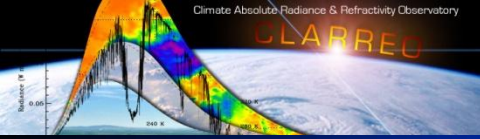
EV-2 Mission Scope & Parameters

- Science Scope
 - The initial AO will have an open science call.
 - The mission is not intended to replace or advance individual Decadal Survey missions, however they can address portions of mission science
- Schedule
 - The mission must have a life cycle of less than or equal to 5 years to launch and total investigation cost not to exceed \$150 million, including operations and data analysis
- Evaluation Criteria
 - Science and mission feasibility are both critical.
 - Maturity and technical readiness of instrument.
- Partnerships
 - Enabling partnerships are encouraged, but the stability & reliability of the partnership will be considered as a risk element in the proposal
 - Hosting an instrument on the ISS or on a partner-provided satellite are acceptable, but the partnership must be established in the proposal



EV-Instruments (EV-I) – Scope of Program

- The third leg of the Venture-class investigations, or Earth Venture-Instruments (EV-I), will solicit proposals for a complete, principal investigator-led instrument to conduct innovative, integrated, hypothesis or scientific question-driven approach to pressing Earth system science issues
 - Annual series of Instrument-Only solicitations, beginning in FY2011 with the 1st selection in FY2012
 - One-step SALMON solicitation. The investigations will be selected in an open competition, to ensure broad community involvement and encourage innovative approaches.
 - Cost capped approach, notionally \$90M per solicitation. More than one instrument may be selected within one solicitation.
 - Instruments will be flown on domestic and international flights of opportunity
 - Instrument will strive to use a common instrument interface, with the interface requirements developed by the ESSP and defined in the AO.
- The PI will retain a central role on the instrument when it is finally manifested and flown



EV-I Opportunities and Plans

- Science Scope
 - The initial AO will have an open science call, no restrictions.
 - The instruments are not intended to replace or advance individual Decadal Survey missions, however they can address portions of mission science, or could be precursor measurements for DS missions
- Cost & Schedule
 - The instrument(s) development time should be up to 4 years from award and must have a life cycle cost not to exceed \$90 million.
- Evaluation Criteria
 - Science and instrument technical feasibility are both critical.
 - Technology development is allowable, but only if the integrated instrument development risk still fits within the schedule and cost.
- Partnerships
 - The proposal does not have to bring a confirmed host mission with it, however suggested or proposed manifests are allowed.
 - The ESD will negotiate flight opportunities